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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/790,627	03/01/2004	Brad N. Mathiowetz	P32.12-0022	1342
27367 7590 10/19/2009 WESTMAN CHAMPLIN & KELLY, P.A. SUITE 1400 900 SECOND AVENUE SOUTH MINNEAPOLIS, MN 55402			EXAMINER CHUO, TONY SHENG HSIANG	
			ART UNIT 1795	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/790,627

Applicant(s)

MATHIOWETZ ET AL.

Examiner

Tony Chuo

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 July 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 and 24-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 24-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. Claims 1-11 and 24-35 are currently pending. Claims 12-23 are cancelled. The amended claims do overcome the previously stated 112, 102, and 103 rejections. However, upon further consideration, claims 1-11 and 24-35 are rejected under the following new 112 and 103 rejections. This action is made FINAL as necessitated by the amendment.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-11 and 24-35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Regarding claim 9, it is unclear what "a battery for use an explosive environment" is referring to. Regarding claim 24, it is unclear what "a data acquisition unit an explosive environment" is referring to. Regarding claim 30, it is unclear what "an apparatus an explosive environment" is referring to.

4. Claims 1, 9, 24, and 30 recite the limitation "the electrical sensory storage cells" in lines 21 to 24. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-3 and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Izaki et al (US 2002/0113685).

The Stafford reference discloses a battery pack comprising: a plurality of battery cells "22", wherein each cell is covered by housing support "26" comprising a first heat-conductor layer "42" that is shaped to conform to a cylindrical portion of an outer surface of the battery that terminates at first layer ends that are on the cylindrical portion of the outer surface of the battery cell, wherein the first layer has a thickness of 0.04 inches and a thermal conductivity of 193 Watts/meter-°K; and a second structural support outer layer "48" that is shaped to conform to an outer surface of the first heat-conductor layer that contacts all of the outer surface of the first heat-conductor layer, and that extends beyond the outer surface to enclose the first layer ends, the second layer defines an exterior surface of the enclosure of the battery cells which separates the battery pack from the environment, wherein the second layer has a thickness of 0.020 inches and a second value of thermal conductivity (See column 3 line 67 to column 4 line 2 and column 4 line 56 to column 5 line 24, and Figures 1, 3, 4, & 5). It also discloses electrical contacts "34" (See column 4, lines 9-10). It also discloses a first heat-

conductor layer that comprises two thermally conductive half-shells "26a" & "26b" that each cover one side of a round surface of the battery (See column 4, lines 18-19).

Examiner's note: The limitation "a combustible atmosphere temperature classification that specifies an outer surface temperature during a short circuit of the electrical energy storage cell" is construed as being an inherent property of the Stafford housing support comprising a first thermally conductive layer that has a first thickness and first thermal conductivity and a second thermally insulating layer that has a second thickness and second thermal conductivity.

In addition, the limitations "in an explosive environment" and "the second layer ... which separates the electrical energy storage cell from the explosive environment" are construed as being intended use. Therefore, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. The Stafford battery is capable of being used in an explosive environment.

Further, it is inherent that when the Stafford battery pack is exposed to an explosive environment, the exterior temperature of the second layer is less than an ignition temperature of the explosive environment during an electrical short circuit of the cells because in the event of an electrical short circuit of the cells, the first layer would dissipate the heat generated, thereby lowering the temperature of the second layer such that the exterior temperature of the second layer is less than an ignition temperature of the explosive environment. In addition, the Stafford battery pack is also an intrinsically

safe equipment in an explosive environment because of the inherent properties of the battery housing support.

However, Stafford et al does not expressly teach a protective device including a fusible link coupled to a connected lead and the electrical energy storage cells which is encased in potting compound; electrical interconnections that interconnect the plurality of battery cells in a series circuit with the protective device and the electrical contacts; and a plastic resin shell shaped to receive the plurality of covered cells and the protective device. The Izaki reference discloses a battery pack comprising: a plurality of batteries and a protective device including a fusible metal "16" (fusible link) coupled to a terminal "4" (connected lead) and the batteries, wherein the fusible metal is encased in a cover film "18" (potting compound); electrical interconnections that interconnect the plurality of batteries in a series circuit with the protective device and the electrical connection leads; and a battery pack body "29" shaped to receive the plurality of covered cells and the protective device (See Figure 9 and 13 and paragraphs [0206],[0211],[0213],[0214]). Examiner's note: It is well known in the art that battery pack housings are made of plastic resin materials.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford battery pack to include a protective device including a fusible link coupled to a connected lead and the electrical energy storage cells which is encased in potting compound; electrical interconnections that interconnect the plurality of battery cells in a series circuit with the protective device and the electrical contacts; and a plastic resin shell shaped to receive the plurality of

covered cells and the protective device in order to prevent overheating of the battery during short circuiting by utilizing a fusible metal to break the circuit, thereby assuring safety of the battery and to utilize an battery case that is easily and economically constructed.

7. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Izaki et al (US 2002/0113685) as applied to claim 1 above, and further in view of Dansui et al (US 2003/0013009).

However, Stafford et al as modified by Izaki et al does not expressly teach a first layer of material that comprises aluminum or copper. The Dansui reference discloses a battery housing that is made of aluminum or copper (See paragraph [0013]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford/Izaki battery housing support to include a first layer of material that comprises aluminum or copper in order to utilize a material that has excellent thermal conduction properties and is suited for suppressing a battery temperature rise.

8. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Izaki et al (US 2002/0113685) as applied to claim 1 above, and further in view of Toyoda (JP 2001-243927).

However, Stafford et al as modified by Izaki et al does not expressly teach a second layer of material that comprises heat-shrink tubing or elastic material. The Toyoda reference discloses a heat shrink member "8" that is also an elastic material that covers a battery (See paragraph [0008]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford/Izaki battery housing support to include a second layer of material that comprises heat-shrink tubing or elastic material in order to improve the reliability of the outer package of the battery while preventing the generation of an outside short circuit.

9. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Izaki et al (US 2002/0113685) as applied to claims 9 and 10 above, and further in view of Maggert et al (US 6724170).

However, Stafford et al as modified by Izaki et al does not expressly teach a plastic resin shell that includes plastic resin separation bars positioned between the cells and the electrical interconnections to reduce shorting. The Maggert reference discloses a plastic casing "202" positioned between the cells and the electrical interconnections to prevent tabs from shorting (See column 3 line 66 to column 4 line 4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford/Izaki battery pack to include separation bars in the plastic resin shell in order to prevent the tabs from shorting to either tabs or other cell housings.

10. Claims 24-27 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Izaki et al (US 2002/0113685), and further in view of Pajakowski et al (US 6718425).

The Stafford reference discloses a battery pack comprising: a plurality of battery cells "22", wherein each cell is covered by housing support "26" comprising a first heat-

conductor layer "42" that is shaped to conform to a cylindrical portion of an outer surface of the battery that terminates at first layer ends that are on the cylindrical portion of the outer surface of the battery cell, wherein the first layer has a thickness of 0.04 inches and a thermal conductivity of 193 Watts/meter-°K; and a second structural support outer layer "48" that is shaped to conform to an outer surface of the first heat-conductor layer that contacts all of the outer surface of the first heat-conductor layer, and that extends beyond the outer surface to enclose the first layer ends, the second layer defines an exterior surface of the enclosure of the battery cells which separates the battery pack from the environment, wherein the second layer has a thickness of 0.020 inches and a second value of thermal conductivity (See column 3 line 67 to column 4 line 2 and column 4 line 56 to column 5 line 24, and Figures 1, 3, 4, & 5). It also discloses electrical contacts "34" (See column 4, lines 9-10).

Examiner's note: The limitation "a combustible atmosphere temperature classification that specifies an outer surface temperature during a short circuit of the electrical energy storage cell" is construed as being an inherent property of the Stafford housing support comprising a first thermally conductive layer that has a first thickness and first thermal conductivity and a second thermally insulating layer that has a second thickness and second thermal conductivity.

In addition, the limitations "an explosive environment" and "the second layer ... which separates the electrical energy storage cell from the explosive environment" are construed as being intended use. Therefore, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention

and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. The Stafford battery is capable of being used in an explosive environment.

Further, it is inherent that when the Stafford battery is exposed to an explosive environment, the exterior temperature of the second layer is less than an ignition temperature of the explosive environment during the electrical short circuit of the cells because in the event of an electrical short circuit of the cells, the first layer would dissipate the heat generated, thereby lowering the temperature of the second layer such that the exterior temperature of the second layer is less than an ignition temperature of the explosive environment.

However, Stafford et al does not expressly teach a protective device including a fusible link coupled to a connected lead and the electrical energy storage cells which is encased in potting compound; electrical interconnections that interconnect the plurality of battery cells in a series circuit with the protective device and the electrical contacts. The Izaki reference discloses a battery pack comprising: a plurality of batteries and a protective device including a fusible metal "16" (fusible link) coupled to a terminal "4" (connected lead) and the batteries, wherein the fusible metal is encased in a cover film "18" (potting compound); and electrical interconnections that interconnect the plurality of batteries in a series circuit with the protective device and the electrical connection leads (See Figure 9 and 13 and paragraphs [0206],[0211],[0213],[0214]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford battery pack to include a protective

device including a fusible link coupled to a connected lead and the electrical energy storage cells which is encased in potting compound; electrical interconnections that interconnect the plurality of battery cells in a series circuit with the protective device and the electrical contacts in order to prevent overheating of the battery during short circuiting by utilizing a fusible metal to break the circuit, thereby assuring safety of the battery.

However, Stafford et al as modified by Izaki et al does not expressly teach an apparatus comprising a data acquisition unit, wherein the apparatus is portable and handheld. The Pajakowski reference discloses a data system (data acquisition unit) for collecting, displaying, and analyzing data that is portable and handheld and is powered by a battery power supply (See Abstract).

Therefore, one skill in the art could have combined the Stafford/Izaki battery pack and the Pajakowski data system by known methods with no change to their respective functions, and the combination would have yielded nothing more than predictable results to one of ordinary skill in the art at the time of the invention.

Examiner's note: It is inherent that the apparatus is intrinsically safe because the combination of a data acquisition unit and a battery cell that has inherent safety features would necessarily result in an apparatus that is intrinsically safe.

11. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Izaki et al (US 2002/0113685) and Pajakowski et al (US 6718425) as applied to claim 24 above, and further in view of Iwasaki et al (US 6325611).

However, Stafford et al as modified by Izaki et al and Pajakowski et al does not expressly teach a short circuit that is external to the battery. The Iwasaki reference discloses an external short circuiting test that forms a hot spot on the cell near the lead member by heat generation due to the resistance of the lead member (See column 7, lines 13-22).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford/Izaki/Pajakowski apparatus to include a short circuit that is external to the battery in order to confirm that the battery can maintain high safety even under the application of an extraordinarily high charge voltage.

12. Claims 30-33 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Izaki et al (US 2002/0113685), and further in view of Kosh (US 2003/0046974).

The Stafford reference discloses a battery pack comprising: a plurality of battery cells "22", wherein each cell is covered by housing support "26" comprising a first heat-conductor layer "42" that is shaped to conform to a cylindrical portion of an outer surface of the battery that terminates at first layer ends that are on the cylindrical portion of the outer surface of the battery cell, wherein the first layer has a thickness of 0.04 inches and a thermal conductivity of 193 Watts/meter-°K; and a second structural support outer layer "48" that is shaped to conform to an outer surface of the first heat-conductor layer that contacts all of the outer surface of the first heat-conductor layer, and that extends beyond the outer surface to enclose the first layer ends, the second layer defines an

exterior surface of the enclosure of the battery cells which separates the battery pack from the environment, wherein the second layer has a thickness of 0.020 inches and a second value of thermal conductivity (See column 3 line 67 to column 4 line 2 and column 4 line 56 to column 5 line 24, and Figures 1, 3, 4, & 5). It also discloses electrical contacts "34" (See column 4, lines 9-10).

Examiner's note: The limitation "a combustible atmosphere temperature classification that specifies an outer surface temperature during a short circuit of the electrical energy storage cell" is construed as being an inherent property of the Stafford housing support comprising a first thermally conductive layer that has a first thickness and first thermal conductivity and a second thermally insulating layer that has a second thickness and second thermal conductivity.

In addition, the limitations "an explosive environment" and "the second layer ... which separates the electrical energy storage cell from the explosive environment" are construed as being intended use. Therefore, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. The Stafford battery is capable of being used in an explosive environment.

Further, it is inherent that when the Stafford battery is exposed to an explosive environment, the exterior temperature of the second layer is less than an ignition temperature of the explosive environment during the electrical short circuit of the cells because in the event of an electrical short circuit of the cells, the first layer would

dissipate the heat generated, thereby lowering the temperature of the second layer such that the exterior temperature of the second layer is less than an ignition temperature of the explosive environment.

However, Stafford et al does not expressly teach a protective device including a fusible link coupled to a connected lead and the electrical energy storage cells which is encased in potting compound; electrical interconnections that interconnect the plurality of battery cells in a series circuit with the protective device and the electrical contacts. The Izaki reference discloses a battery pack comprising: a plurality of batteries and a protective device including a fusible metal "16" (fusible link) coupled to a terminal "4" (connected lead) and the batteries, wherein the fusible metal is encased in a cover film "18" (potting compound); and electrical interconnections that interconnect the plurality of batteries in a series circuit with the protective device and the electrical connection leads (See Figure 9 and 13 and paragraphs [0206],[0211],[0213],[0214]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford battery pack to include a protective device including a fusible link coupled to a connected lead and the electrical energy storage cells which is encased in potting compound; electrical interconnections that interconnect the plurality of battery cells in a series circuit with the protective device and the electrical contacts in order to prevent overheating of the battery during short circuiting by utilizing a fusible metal to break the circuit, thereby assuring safety of the battery.

However, Stafford et al as modified by Izaki et al does not expressly teach an apparatus comprising a calibrator, wherein the apparatus is portable and handheld. The Kosh reference discloses a handheld calibration module "12" and a battery located in the handheld module (See paragraphs [0016],[0018]).

Therefore, one skill in the art could have combined the Stafford/Izaki battery pack and the Kosh calibrator by known methods with no change to their respective functions, and the combination would have yielded nothing more than predictable results to one of ordinary skill in the art at the time of the invention.

Examiner's note: It is inherent that the apparatus is intrinsically safe because the combination of a calibrator and a battery cell that has inherent safety features would necessarily result in an apparatus that is intrinsically safe.

13. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Izaki et al (US 2002/0113685) and Kosh (US 2003/0046974) as applied to claim 30 above, and further in view of Iwasaki et al (US 6325611).

However, Stafford et al as modified by Izaki et al and Kosh does not expressly teach a short circuit that is external to the battery. The Iwasaki reference discloses an external short circuiting test that forms a hot spot on the cell near the lead member by heat generation due to the resistance of the lead member (See column 7, lines 13-22).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford/Izaki/Kosh apparatus to include a short circuit that is external to the battery in order to confirm that the battery can

maintain high safety even under the application of an extraordinarily high charge voltage.

Response to Arguments

14. Applicant's arguments with respect to claims 1-11 and 24-35 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Chuo whose telephone number is (571)272-0717.

The examiner can normally be reached on M-F, 9:00AM to 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TC

/Jonathan Crepeau/
Primary Examiner, Art Unit 1795